IN THE CLAIMS

The claims for this application are listed below.

1. (Original) A method of decoding a coded data stream of a plurality of cells, the uncoded data stream comprising a plurality of segments each formed of a preamble of fixed length and a series of data bits, wherein:

the coded data stream includes at least two cells and one transition for each data bit and a portion without a transition at the beginning of each preamble, the said portion having the maximum period in the coded data stream without a transition and being longer than a bit period, the method characterised by:

detecting transitions in the coded data stream;

determining the maximum period in the data stream without a transition;

determining a first threshold corresponding to a period of time less than the maximum period and greater than the data bit period;

determining whether a considered transition corresponds to a data bit or a preamble based on the time between the considered transition and a preceding transition compared with said first threshold; and

if the considered transition corresponds to a data bit, determining the data bit based on the considered transition and the preceding considered transition.

2. (Original) A method according to claim 1, wherein the encoded data stream includes preambles of at least a first type and a second type, the first type and the second type being distinguished by different patterns of transitions in the respective preamble after the portion without a transition, the method further comprising:

distinguishing whether a preamble is a first type or a second type, depending on the pattern of transitions after the portion without a transition.

3. (Original) A method according to claim 2, wherein the first type includes B preambles and the second type includes M and W preambles.

4. (Original) A method according to claim 1, further comprising:

determining a second threshold corresponding to a period of time less than the data bit period and greater than a cell period, and

if the considered transition corresponds to a data bit, setting a holdoff period to the second threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered.

5. (Original) A method according to claim 1, further comprising:

determining a third threshold corresponding to a period of time which is less than the time between the end of the maximum period and the end of the preamble and which is greater than the maximum period, and

if the considered transition corresponds to a preamble, setting a holdoff period to the third threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered.

6. (Original) A method according to claim 1, further comprising:

determining a second threshold corresponding to a period of time which is less than the data bit period and which is greater than a cell period; and

determining a third threshold corresponding to a period of time which is less than the time between the end of the maximum period and the end of the preamble and which is greater than the maximum period, and

if the considered transition corresponds to a data bit, setting a holdoff period to the second threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered, and

if the considered transition corresponds to a preamble, setting a holdoff period to the third threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered.

7. (Original) A method according to claim 6, wherein a data bit not forming part of the uncoded data stream is detected and discarded.

8. (Original) A method according to claim 5, further comprising:

if the detected transition corresponds to a preamble:

setting a flag on;

determining whether the preamble is a first or second type based on whether the time between the next considered transition after the holdoff period has expired and the transition immediately preceding the next considered transition is greater than the first threshold; and

setting the flag off.

9. (Original) A method according to claim 1, further comprising:

storing decoded data bits as words in a FIFO; and

processing the decoded data from the FIFO in a logic block using a clock, wherein the speed of the clock is adjusted according to the number of words stored in the FIFO.

10. (Original) A method according to claim 9, further comprising forming the decoded data bits into said words using a shift register before storing the words in the FIFO.

11. (Original) A method according to claim 1, further comprising:

generating a clock having a generated frequency faster than the frequency of the cells in the coded data stream;

sampling the coded data stream at the generated frequency; and

outputting a pulse each time a transition is detected.

12. (Original) A method according to claim 1, further comprising outputting an enable pulse each time a data bit is determined.

13. (Original) A method according to claim 1, further comprising outputting an sync signal each time a preamble is determined.

14. (Original) A method of processing a digital data signal, comprising:

storing data in a FIFO; and

processing the data from the FIFO in a logic block using a clock, wherein

the speed of the clock is adjusted according to the number of words stored in the FIFO.

15. (Original) An apparatus for decoding a coded data stream of a plurality of cells, the uncoded data stream comprising a plurality of segments each formed of a preamble of fixed length and a series of data bits, wherein:

the coded data stream includes at least two cells and one transition for each data bit and a portion without a transition at the beginning of each preamble, the said portion having the maximum period in the coded data stream without a transition and being longer than a bit period, the method characterised by:

a detector for detecting transitions in the coded data stream;

a timer for determining the time between adjacent transitions;

logic for determining the maximum period in the data stream without a transition and for determining a first threshold corresponding to a period of time less than the maximum period and greater than the data bit period; and

a filter for determining whether a considered transition corresponds to a data bit or a preamble based on the time between the considered transition and a preceding transition compared with said first threshold and, if the considered transition corresponds to a data bit, determining the data bit based on the considered transition and the preceding considered transition.

16. (Original) An apparatus according to claim 15, wherein the encoded data stream includes preambles of at least a first type and a second type, the first type and the second type being distinguished by different patterns of transitions in the respective preamble after said portion without a transition, wherein

the filter is arranged to distinguish whether a preamble is a first type or a second type, depending on the pattern of transitions after the portion without a transition.

17. (Original) An apparatus according to claim 16, wherein the first type includes B preambles and the second type includes M and W preambles.

18. (Original) An apparatus according to claim 15, wherein:

the logic is arranged to determine a second threshold corresponding to a period of time less than the data bit period and greater than a cell period, and

if the considered transition corresponds to a data bit, the filter is arranged to set a holdoff period to the second threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered by the filter.

19. (Original) An apparatus according to claim 15, wherein:

the logic is arranged to determine a third threshold corresponding to a period of time which is less than the time between the end of the maximum period and the end of the preamble and which is greater than the maximum period, and

if the considered transition corresponds to a preamble, the filter is arranged to set a holdoff period to the third threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered by the filter.

20. (Original) An apparatus according to claim 15, wherein:

the logic is arranged to determine a second threshold corresponding to a period of time which is less than the data bit period and which is greater than a cell period and a third threshold corresponding to a period of time which is less than the time between the end of the maximum period and the end of the preamble and which is greater than the maximum period, and

if the considered transition corresponds to a data bit, the filter is arranged to set a holdoff period to the second threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered by the filter, and

if the considered transition corresponds to a preamble, the filter is arranged to set a holdoff period to the third threshold, whereby transitions after the considered transition and before the end of the holdoff period are not considered by the filter.

21. (Original) An apparatus according to claim 20, wherein a data bit not forming part of the uncoded data stream is detected and discarded.

22. (Original) An apparatus according to claim 19, wherein the filter is arranged to:

set a flag on if the considered transition corresponds to a preamble;

determine whether the preamble is a first or second type based on whether the time between the next considered transition after the holdoff period has expired and the transition immediately preceding the next considered transition is greater than the first threshold; and

set the flag off.

23. (Original) An apparatus according to claim 15, further comprising:

a FIFO for storing decoded data bits as words; and

a logic block using a clock for processing the decoded data from the FIFO, wherein the speed of the clock is adjusted according to the number of words stored in the FIFO.

24. (Original) An apparatus according to claim 23, wherein the clock used by the logic block comprises a direct digital synthesis unit and the apparatus further comprises a clock controller for controlling the speed of the direct digital synthesis unit according to the number of words stored in the FIFO.

25. (Original) An apparatus according to claim 23, further comprising a shift register for forming the decoded data bits into said words for storing in the FIFO.

26. (Original) An apparatus according to claim 15, further comprising:

a clock having a generated frequency faster than the frequency of the cells in the coded data stream;

a sampler for sampling the coded data stream at the generated frequency; and

an edge detector for outputting a pulse each time a transition is detected, wherein the filter is a pulse filter arranged to operate on the pulses output by the edge detector and the timer is arranged to operate on the pulses output by the edge detector.

27. (Original) An apparatus according to claim 15, wherein the filter outputs an enable pulse each time a data bit is determined.

28. (Original) An apparatus according to claim 15, wherein the filter outputs a sync signal each time a preamble is determined.

29. (Currently Amended) ~~A method of~~ An apparatus for processing a digital data signal, comprising:

a FIFO for storing the data; and

a logic block using a clock processing the data from the FIFO, wherein

the speed of the clock is adjusted according to the number of words stored in the FIFO.

30. (Original) A method of decoding a biphase coded data stream comprising a plurality of words formed of a plurality of cells of equal period, the cells in each word forming a preamble and a series of data bits, wherein:

the preamble comprises a predetermined plurality of cells and each data bit comprises two cells;

there is a transition between cells of adjacent data bits;

there is a transition between a data bit cell and an adjacent preamble cell; and

a predetermined maximum period in the data stream without a transition is formed at the beginning of the preamble, the maximum period being longer than the cell period, the method characterised by:

detecting transitions in the data stream;

determining a threshold corresponding to the maximum period in the data stream without a transition;

determining whether a transition corresponds to a data bit cell or the preamble based on the time between the transition and a preceding transition compared to the threshold; and

if the transition corresponds to a data bit cell, determining the data bit represented by the data bit cell based on the transition and the transition of a cell of an adjacent data bit.

31. (Original) An apparatus for decoding a biphase coded data stream comprising a plurality of words formed of a plurality of cells of equal period, the cells in each word forming a preamble and a series of data bits, wherein:

the preamble comprises a predetermined plurality of cells and each data bit comprises two cells;

there is a transition between cells of adjacent data bits;

there is a transition between a data bit cell and an adjacent preamble cell; and

a predetermined maximum period in the data stream without a transition is formed at the beginning of the preamble, the maximum period being longer than the cell period, the apparatus comprising:

a detector for detecting transitions in the data stream;

logic for determining a threshold corresponding to the maximum period in the data stream without a transition; and

a filter for determining whether a transition corresponds to a data bit cell or the preamble based on the time between the transition and a preceding transition compared to the threshold and, if the transition corresponds to a data bit cell, for determining the data bit represented by the data bit cell based on the transition and the transition of a cell of an adjacent data bit.

32. (Original) An apparatus according to claim 31, wherein the filter is implemented as a state machine.